

Claims

1 1. A solid sheet suitable for use as at least one layer of a polymeric
2 floor covering, wherein said solid sheet comprises a polyalkene resin in
3 intimate admixture with at least one additive comprising a filler, wherein said
4 polyalkene resin is a polyalkene resin obtained by a single site catalyzed
5 polymerization of at least one, linear, branched or cyclic alkene having from 2
6 to 20 carbon atoms.

1 2. A solid sheet according to claim 1, which polyalkene resin has a
2 molecular weight distribution of less than 3.

3. A solid sheet according to claim 1 wherein said polyalkene is
one having the following characteristics:

- a) Melt Index of from 0.1 to 100 dg/minute;
- b) Density of from 0.86 to 0.97 g/cm³; and
- c) a small amount of long chain branching which amount is defined as a Dow Rheology Index of from 0.1 to 6.0 measured by comparing the shift to the right, relative to a polymer resin with zero long-chain branching, in a plot of zero shear viscosity against relaxation time.

1 4. A solid sheet according to claim 3 wherein said polyalkene resin
2 has a Dow Rheology Index of from 0.4 to 5.5.

1 5. A solid sheet according to claim 1 wherein said polyalkene
2 comprises a copolymer obtainable by copolymerization of at least two alkenes
3 comprising a first, linear or branched, alkene having from 2 to 8 carbon atoms
4 and, at least one comonomer, which comonomer comprises a linear, branched
5 or cyclic, alkene having from 2 to 20 carbon atoms.

1 6. A solid sheet according to claim 5 wherein said first monomer
2 comprises ethylene and said at least one comonomer is selected from butene-1,
3 hexane-1, and norbornene.

1 7. A solid sheet according to claim 5 wherein said comonomer is
2 present in an amount of up to 15 mole percent based on the total amount of said
3 monomer.

1 8. A solid sheet according to claim 1 which includes a polymer,
2 said polymer being obtainable by polymerization of a liquid plasticizer
3 monomer system which is:

- 4 (i) non-polymerizable under sheet forming conditions used in floor
5 covering sheet material manufacture;
6 (ii) whilst being polymerizable subsequently after forming of said
7 intimate admixture of said polyalkene resin, and said at least one
8 additive, together with said polymerizable plasticizer monomer

9 system into a sheet, so as to produce a sheet material free of
10 liquid plasticizer monomer,
11 at least one of said polymer and said polyalkene resin being cross-
12 linked so that polymer chains of said polymer and polymer chains of said
13 polyalkene resin together form an at least semi-interpenetrating network of
14 polymer chains.

1 9. A solid sheet according to claim 8 wherein said plasticizer
2 monomer comprises a linear, branched or cyclic alkene having at least 10
3 carbon atoms and a polymerizable terminal function group.

1 10. A solid sheet material according to claim 1, which solid sheet is
2 itself suitable for use directly as a polymeric floor covering.

1 11. A solid sheet according to claim 1 which is free of liquid
2 plasticizer.

1 12. A process for the production of a solid sheet suitable for use as
2 at least one layer of a polymeric floor covering, said process comprising the
3 steps of:

4 providing a polyalkene resin obtained by a single site catalyzed
5 polymerization of at least one, linear, branched or cyclic, alkene having from 2
6 to 20 carbon atoms and at least one additive comprising an inorganic filler;

7 bringing said polyalkene resin into intimate admixture with said at least
8 one additive in a high shear mixer for a period of at least 10 minutes at an
9 elevated temperature of at least 75°C for melting the polyalkenes and sufficient
10 to bring the mixture into a fluid state without degradation of the mixture;
11 forming the fluid mixture into a sheet form; and
12 allowing said sheet to cool and solidify.

1 13. A process according to claim 12 which includes the further step
2 of incorporating into the mixture a sheet forming processing aid.

1 14. A process according to claim 12 wherein the sheet forming
2 process comprises spread coating.

1 15. A process according to claim 14 wherein a liquid plasticizer is
2 used as a spread coating aid in said spread coating step.

1 16. A process according to claim 15 wherein a liquid paraffin is
2 used as a spread coating aid in said spread coating step.

1 17. A process according to claim 13 wherein the step of
2 incorporating into the mixture a sheet formation processing aid comprises the
3 further step of incorporating a polymerizable liquid plasticizer monomer
4 system which is:

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- 5 (i) non-polymerizable under sheet forming conditions used in floor
6 covering sheet material manufacture, while
7 (ii) being polymerizable subsequently so as to produce a polymer
8 material free of liquid plasticizer monomer.

1 18. A process according to claim 17 which process includes the
2 further step of treating the sheet form material so as to induce polymerization
3 of said liquid plasticizer monomer system thereby to produce a sheet material
4 free of liquid plasticizer.

1 19. A process according to claim 18 wherein said sheet forming step
2 is carried out at from 70 to 120°C and said polymerization step is carried out at
3 from 150 to 250°C.

1 20. A process according to claim 12 wherein the sheet forming
2 process step comprises the further step of rolling said fluid mixture on a
3 calendar.